

## EVALUATION OF THE EXTERIOR OF HOLSTEIN AND SIMMENTAL PRIMIPAROUS COWS

Aleksandra KONSTANDOGLO<sup>1</sup>, V. FOKSHA<sup>1</sup>, G. STRATAN<sup>2</sup>, D. STRATAN<sup>2</sup>

<sup>1</sup>Scientific and Practical Institute of Biotechnologies in Zootechny and Veterinary Medicine,  
Republic of Moldova

<sup>2</sup>Society of limited liability „Strapit”, s. of Kalarash, Republic of Moldova

Corresponding author email: [aconstandoglo@yahoo.com](mailto:aconstandoglo@yahoo.com)

### Abstract

*The aim of presented research is to study the exterior features and the morphological and functional parameters of the udder of primiparous cows of Holstein and Simmental breeds in the herd SLL "Strapit", Kalarash. Research carried out on Holstein primiparous cows (n = 19), Simmental (n = 22) of the Austrian origin. In order to establish the main features of the exterior of the body measurements were taken basic body measurements and defined physique indexes.*

*As a result of research it was established that primiparous cows of Holstein breed is well defined type of dairy cattle, confirming their proportional physique shape, the development of the middle part of the body, strong bone. Simmental primiparous cows for measurements the height at the withers by 3.3% and in the sacrum by 1.2% exceed the minimum requirements of the standard. Chest well developed in depth, wide enough, which is characteristic for the Simmental.*

*Udder of primiparous cows of Holstein breed differs bulkiness, with the developed portions, advantageously tightly attached. Visually, the external structure of the udder of these animals differs by a greater extent along the belly and enough depth than at heifers of Simmental breed.*

**Key words:** *Holstein, Simmental breed, exterior, index physique, the udder.*

### INTRODUCTION

One of the main problems of modern selection science and zootechnical practice is to obtain animals, combining high productivity with a strength build, suitable for long-term use in industrial technology. Cow of a dairy direction differs with its inherent exterior forms with its peculiar morphofunctional structure of tissue and orientation of physiological processes in the body.

The best specialized dairy breed in the world is the Holstein, which together with high indicators of milk production is characterized by excellent qualities of the exterior thanks to the purposeful selection of animals on the exterior type and has been established this breed (Ackles, 1960).

It should be noted that the genotype of the Austrian Simmental is well selected for the industrial production of milk, which is important for our country.

As it is known a large part of the morphological traits of the udder is the most important and reliable exterior indicators of high milk production and manufacturability of cows (Von

Keyserlink et al., 2012; Weary, 2012; Kotendzhi et al., 2007; Kotendzhi et al., 1996).

The study of exterior of animals of Holstein and Simmental breeds grown and used in the same conditions of SLL "Strapit", is quite important from a practical and a scientific point of view. Therefore, the aim of research was to examine the exterior of the body and the morphological and functional parameters of the udder of Holstein heifers and Simmental breeds.

### MATERIALS AND METHODS

The studies were conducted in a herd of pedigree cattle of Holstein and Simmental breeds SRL "Strapit". The exterior of tested animals were studied by the development of the main items of the body structure, measurements of which were taken with dimensional instruments by the standard technique during 2-3 months after calving.

On the foundation of measurements were calculated indices of the build: long-legged, prolixity, hip- breast, chest, consistency, outgrowing, awl back, raw-boned on which

were built exterior profile by the conventional method (Kostomahin, 2007). Morphological and functional properties of the udder were evaluated on the second - third month of lactation according to conventional techniques, (Metodical materials, 1970).

The obtained results of research were processed by methods of variation of statistics and determination of significance of differences according to Merkurev et al., 1983, in Excel, the accuracy of the figures estimated by Student's.

## RESULTS AND DISCUSSIONS

Analysis of body measurements of primiparous cows of different breeds showed that at the animals of Holstein breed is well defined the type of dairy cattle, confirming their proportional body shape, the development of the middle part of the body, strong bones, Table 1.

Table 1. Linear Indicators of measurements of items of the primiparous cows body of Holstein breed

Measurements	Indicators	
	M±m, cm	Cv, %
Estimated animals, heads	19	
Height at withers	145.1±0.95	2.86
Height at the croup	151.4±0.86	2.48
The depth of the thorax	70.5±0.7	4.34
The width of the thorax	45.8±0.35	3.37
The width of the croup	52.0±0.37	3.13
The width of the croup at Ischia	34.7±0.26	3.31
Length of the body	159.2±0.5	1.37
The thorax perimeter	193.4±1.15	2.59
The whistle perimeter	19.5±0.07	1.59

So, according to high-altitude measurements primiparous cows of Holstein breed were quite tall - 145.1 cm - height at the withers and 151.4 cm - in the sacrum. Chest well developed in depth - 70.5 cm, width - 45.8 cm and girth 193.4 cm.

Primiparous cows of Simmental breed for most of measurements, except metacarpus, exceed the minimum value standard on the given breed (Table 2, Figure 1).

As it is seen, the animals of Simmental breed by altitude measurements also are tall height at the withers by 3.3% and in the sacrum by 1.2% exceed the minimum requirements of the standard. Chest is well developed in depth - 2.6%, is wide enough - by 2.7%, with a girth of 6% above the standard, which is typical for the Simmental breed.

Table 2. Linear Indicators of measurements of items of the primiparous cows body of Simmental breed

Measurements	Indicators		Standard
	M±m, cm	Cv, %	
Estimated animals, heads	22		
Height at withers	139.5±0.45	1.53	135
Height at the croup	146.8±0.58	1.85	145
The depth of the thorax	71.8±0.31	2.06	70
The width of the thorax	46.2±0.21	2.17	45
The width of the croup	55.6±0.2	1.73	55
The width of the croup at Ischia	36.4±0.22	2.88	36
Length of the body	159.3±0.4	1.16	155
The thorax perimeter	203.6±0.96	2.21	192
The whistle perimeter	22.6±0.07	1.46	23

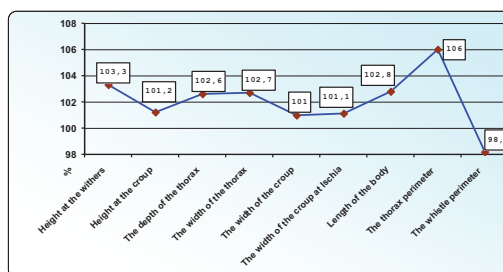


Figure 1. The exterior profile of Simmental primiparous cows

It should be mentioned that the use of body indices allows us to obtain the relative numerical values that characterize the exterior type of dairy cattle in the correlative harmony of all articles of constitution.

Indices of the body of heifers of Holstein and Simmental breeds of investigated animal groups are shown in Table 3.

Table 3. Indices of the body of primiparous cows of Holstein and Simmental breeds, %

Index	Holstein	Simmental	The breed standard of various productivity directions	
			Dairy	Dairy and Meat
Long-legged	51.4	48.5	45.2	48.2
Prolixity	109.7	114.2	120	118.4
Pelvic-thoracic	88.0	83.1	80.2	85.5
Thoracic	64.9	64.3	61.8	68.8
Consistency	121.5	127.8	118	121.3
Outgrown	104.3	105.2	100.9	102.5
Osseous	13.4	16.2	14.6	15.4

The obtained high leggy index at animals of Holstein breed indicates that they are more long- legged than primiparous cows of Simmental breed, and as a whole the average level of the index 51.4 and 48.5% respectively, characterizes the good development of the organism in a postnatal ontogenesis of animals in both groups. The smaller value of the index

of long-legged animals of Simmental breed (48.5%) is characteristic for the species of milk-meat direction of productivity.

The lower level of the index proximity, or format, is inherent to dairy cattle with the best characteristic of the quality of exterior type. As the value of indicators of our research, at primiparous cows of Holstein breed the index of stretching amounted to 109.7%, which is with 8.6% less in comparison with the standard for dairy breeds of productivity directions. Index proximity of Simmental heifers is by 3.5% lower in comparison with the standard for breeds of dairy and meat direction of productivity, which is also characterized by its good quality exterior.

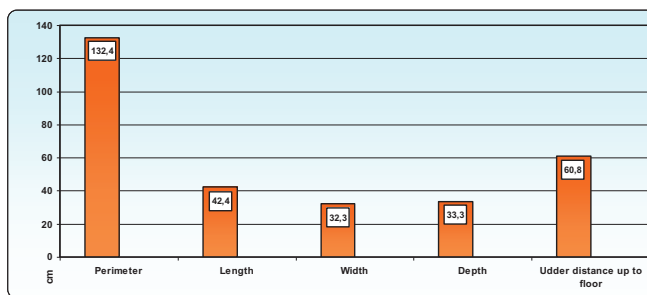
On the overall development of the body and body weight, in particular, can be judged by the index of consistency or compactness. It should be noted that the Holstein primiparous cows and Simmental breeds characterizes compact body with the index of consistency with 127.8 to 121.5%, respectively, which is peculiar to them during the studied period of development.

The ratio of height in the sacrum to the height at the withers is characterized by the index of outgrown, which is a good indicator of growth and development in the postnatal period. The corresponding average indices of our research

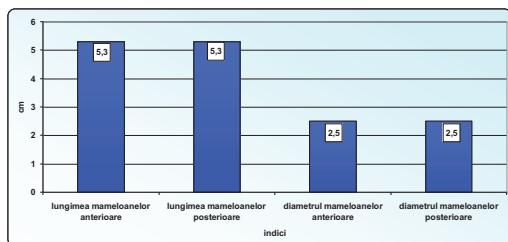
of this given index (104.3 and 105.2%) show an equally good development of the body of animals of both breeds or primiparous cows of Holstein breed the indicator of bony index was with 8.2% below the standard for dairy breeds of productivity direction for primiparous cows of Simmental - with 0.8% lower than the standard for breeds of dairy - meat direction, and the proportion of the body of animals of analyzed breeds are preserved.

Thus, the results of the visual and the index evaluation showed that Holstein primiparous cows had expressed milk type and primiparous cows of Simmental - milk-meat type build. They are characterized by a good body shape and a strong constitution, from which largely depends the level of milk production, health and the duration of the period of productive use.

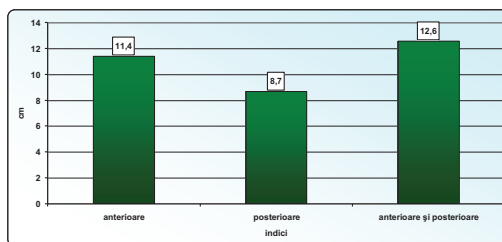
**The form and morphological properties of udder** are one of the important features exterior. Mammary gland with its features that characterize the size, shape, share development, location and size of the nipples, reflects the potential productivity of animals. Indicators of measurements, which are shown in Figure 2, characterize the development of morphological traits of the udder at Holstein primiparous cows of herd SLL "Strapit".



a) size of the udder



b) size of nipples



c) the distance between the nipples

Figure. 2. Morphological signs of udder of primiparous cows of Holstein breed

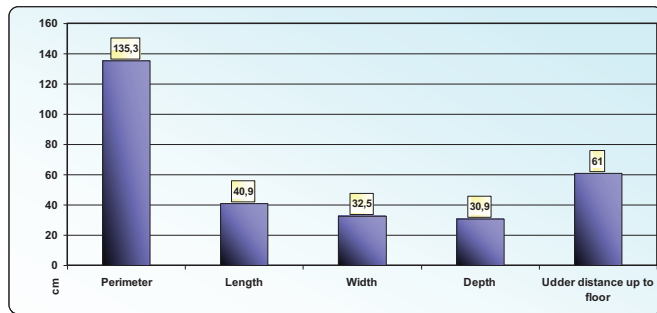
As it is seen, the average value of measurements of girth (132.4 cm), length (42.4 cm) and width (32.3 cm) were higher than the minimum requirements for the evaluation of the udder at primiparous cows of Holstein breed. Udder is quite deep and has an average of 33.3 cm.

The length of the front nipples were within 5.3 cm, rear - 2.5 cm. The diameter of nipples and the distance between the nipples teats of the udder corresponded to the standard location, convenient for milking. The distance from the bottom of the udder till the ground was within the allowable standards - 60.8 cm.

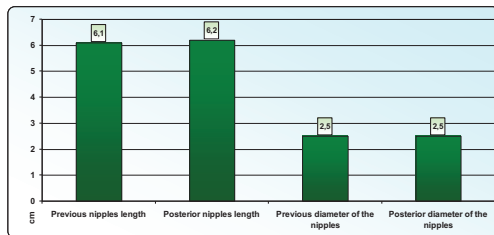
It is believed that the distance from the bottom of the udder till the ground should be 45-50 cm

because too saggy udder prevents the free movement of cows, it is inconvenient for machine milking is more polluted. All measured primiparous cows of Holstein breed had a desired bath-shaped form of the udder, the development of quarters of the udder is symmetrical, uniform, dense attachment to the body, and bottom of the udder is horizontal, nipples of cylindrical shape.

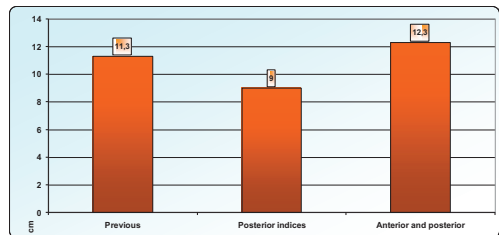
The magnitude of the udder measurements of primiparous cows of Simmental breed exceeded the minimum requirements for the evaluation of the udder and nipples of cows of Simmental breed for the first lactation (Figure 3).



a) size of the udder



b) size of the nipples



c) the distance between the nipples

Figure 3. Morphological signs of udder of primiparous cows of Simmental breed

So udder girth averaged 135.3 cm that is with 35.3 cm bigger the length - 6.9, with - 2.5 and depth - with 5.9 cm bigger than the minimum requirements for cows of Simmental breed (Kobtsev et al., 2011).

The length of the front nipples was in the normal range and the average was 6.1 cm, the diameter of the nipples and the distance between them were within normal limits. The shape of the udder 66.7% of heifers of Simmental breed had a bath form, 33.3% - a bowl form.

Thus, the udder of primiparous cows of Holstein breed differs bulky, with the developed portions, preferably tightly attached. Visually, the external structure of the udder of these animals differs with more length on the belly and enough depth than at heifers of Simmental breed.

## CONCLUSIONS

1. Primiparous cows of Holstein breed are fairly tall: height at the withers on average is 145.1 cm, height at sacrum - 151.4 cm, with a

well-developed breast in depth – 70.5 cm, in width - 45.8 cm, and girth – 193.4 cm.

2. Primiparous cows of Simmental breed on measurements of height at the withers and in the rump exceed the minimum standards for the breed by 3.3 and 1.2%, respectively.

3. Primiparous cows of Holstein and Simmental breeds are characterized by a compact body with an index of consistency at 121.5 and 127.8%, respectively, which is peculiar to them in the studied period of the development.

4. The average values of index outgrown 104.3% (Holstein) and 105.2% (Simmental) indicate an equally good development of the body of animals of both breeds.

5. Udder of primiparous cows of Holstein breed differs bulky, with the developed portions, preferably tightly attached, the external structure of the udder of these animals differs by more length on the belly and enough depth than primiparous cows of Simmental breed.

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